Perception of Green Technology Among TVET Professional in Pakistan

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Abstract

Green technology concept is increasing in Pakistan. The objective of green technology is to make clean environment and sustain biodiversity. The increasing implication of sustainability is having a key impact on business industry and association, as well as society as a whole. Hence, readiness of the forthcoming workforce for the coming green economy is a challenging task for Technical Vocational Education and Training authorities in Pakistan. Hence, the objective of this research was to identify the perception of TVET professional in Pakistan. A sample of 30 TVET professional across Pakistan was randomly selected. The research identified that most of the TVET professional statement that their perception of green technology is relatively high, the use of green technology application is moderate. daily application of green technology in their lives is only moderate. Interestingly, in the open-ended section, TVET professionals were asked to state an example of a greening TVET, 35% of the respondents admitted that they do not know. Further, almost half of the respondents state that greening elements are included in different TVET programs curriculum.

Keywords: TVET Professional, Green Technology, Greening TVET, Technology Acceptance Model

Introduction

Changing skills demand at different level in industry due to green technology, TVET - Technical and Vocational Education and Training system has to develop greening TVET on priority basis. (Ramlee, 2019) discussed that with reducing natural

resources, the world is considering for viable alternatives in terms of generating renewable energy. Digital Pakistan" initiative is taken by the government that aimed to use green technology for country's social welfare, which further be enhance for achieving environmental sustainability over a time horizon (H.Ahmed et_al, 2020). United Nations report on Green Technological Transformation (Che In, F.; and Ahmad, A.Z., 2017) asserts that overall assessment on the countries' policy on the environment is critical.

To achieve green growth, it is important to ensure the low carbon green technologies (Stewart, 2011). To preserve eco-friendly quality, we need clean air, non-toxic water, renewable energy, stable climate, and green waste management. Forthcoming generation is imagining a better world for them and sustaining the mother earth must start with green responsiveness from the early age.

However, literature has shown that awareness of green practices and products among professionals and students are only moderate (Chin, C.; and Ng, Y.J., 2015). An online survey was conducted by (Susan K. Taylor, Heather Creec, 2012) in which 30 TVET administrator and teachers was the respondents. The 13% described themselves as having "no knowledge at all of the concept of education for sustainable development," and 50% said they had "heard of the concept, but have no detailed knowledge of it." Only 3% of respondents felt they knew the concept "very well". Thus, the objective of the research was to identify green technology perception among TVET professional in Pakistan.

Study background

In the context of epistemology of green skill, it is defined as the abilities to perform and solve problems in the green occupations. They include the mindset, knowledge, abilities, and attitudes that an individual possesses to live in, to work in, to develop and to support a sustainable and resource-efficiency environment (CEDEFOP, 2012).

The Rio Declaration and Kyoto Protocols are two protuberant declarations on the environment besides the Earth Charters. These world programs were designed to protect this planet from environmental harmful activities and to sustain balance development (Mustapha, R., & Nashir, I.M. 2019). The countries that signed in must show commitment to implement the declarations and protocols based on green paradigm. As such, green technology, green economy and green lifestyle are on the top priority list of the United Nations' agenda in order to sustain the mother earth and to reduce global warming.

Majumdar (2011) has proposed that a greening strategy by inserting green paradigm in Technical and Vocational Education and Training (TVET). TVET is a prime platform to provide technical workforce. He suggests "greening" TVET by introducing five components of institutional operations to extend sustainable development principles in TVET institutions. These five components are as follows:

- Green Culture
- Green Campus
- Green Curriculum
- Green Community
- Green Research and Technology

(R. Mustapha et_al, 2019) argued that in the green paradigm, issues relating to education and training should be viewed in the overall context of education for sustainable development. He suggests that the nurturing of green mindset is the upmost importance to spearhead green revolution. However, "green" education and training are constrained by several factors such as slow responsiveness of education and training institutions in creating futuristic curricula for green jobs. Therefore, improving green education and training in terms of intensifying green awareness, green knowledge and skills of the existing principal, trainers, instructor, and the future generation is critical.

Objective of the study

According to (Shoaib Sultan, M. Ajmal, and M. Farouq, 2016) that environmental awareness among teachers, school education, in Pakistan is very high. This is due to religion that also focuses on the importance of environmental education. Green skills are important especially for TVET professionals so that they could teach students about importance of green technologies and adopt best practices. In Pakistan, society actors may be preoccupied with the economic survival than to worry about environmental quality. It is often said that not-so-rich countries focus on the 'development' and

those of richer countries pay attention to the 'environment'. Hence, the ways to achieve 'sustainable development' remain ambiguous (Mustapha, R 2015).

According to United Nations (UN, 2013), the world population will reach 9.6 billion people by 2050, from 7.2 billion today. Thus, if the current modes of consumption continue, the resources of 'two' planet earths may be required to sustain the population in 2050.

The main objective of the study is to find out the perception of green technology among TVET professional of Pakistan. In this study, participants are randomly selected from different Technical Education and Vocational Training Authorities (TEVTAs) of Pakistan. Furthermore, use of green technology applications in TVET institutions are also find and finally identified the percentage of green elements incorporated in TVET programs curriculum.

Research questions

The following are the research questions formulated for this study.

1. What is the perception of green technology among the TVET professionals (Administrator, Trainers)?

2. What are the green technology use by the TVET professional to achieve the sustainability and safe the environment?

3. Do TVET professional adopt the recycling practices at workplace environment – attitude s on the environment and practice of recycling waste?

4. Do they have idea of Greening TVET and implementing its five pillars in institutional context?

5. What are the suggestions would you like to give to other people in Pakistan related to green technology?

Research methodology

The Technological Acceptance Model – 1989 (Singh, B.R.; and Singh, O., 2012) is used. This prototypical clarifies about users' awareness on usability of a technology. The prototypical contains elements such as (a) perceived usefulness (PU) and (b) perceived ease-of-use (PEOU). This model is an extension to the theory of reasoned action (TRA) by Ajzen and Fishbein. This philosophy accepts some forms of meanings to act.

The instrument for data collection consisted of a structured questionnaire. The instrument has four sections 'I', 'II', and 'III'. The section "I" sought information about the rationale, study objectives, research questions, direction in answering and method. The section "II" is required information on personal data of the respondent such as name, gender, age, reporting agency and address. The section "III" contains questions to be addressed by the respondent.

The research methodology used in this research was a multiple site with multiple cases. A sample of 30 TVET professional from a population of 54 TVET Principal, teachers etc from different public TVET authorities of Pakistan was selected randomly. A questionnaires was built based on the research objectives and the conceptual framework. The 5-point Likert scale questionnaire (1=Strongly Disagree; 2=Disagree; 3=Uncertain 4=Agree; 5=Strongly Agree) was validated by a expert in the ground and also in a pilot test. Green perception and practice of prospective TVET professional were measured in this empirical research.

Results

Demographics variables

In this section, demographics variables are defined. The total number of respondesnts are *(n= 30)*.
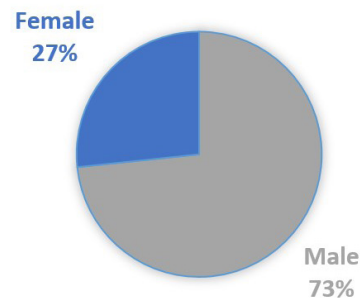

Figure 1: Demographic variables information

73% respondents are male and 27% are female respondents. In this research more male are selected from teaching side of TEVTAs in Pakistan. In terms of the age bracket, the majority of the respondents were between 31 – 40 years old.

Green technology perception

Reference to the perception of green technology (see Table 1), in general, the TVET professionals have positive

attitude toward green technology (M=4.46; SD=0.66). They strongly agreed that green technology was important (M=4.42; SD=0.68) and it could improve respondents value of life knowledge (M=4.43; SD=0.61). Respondents recognized that planting trees will help reduce greenhouse effect (M=4.53; SD=0.66) and it could inspire economic growing (M=4.33; SD=0.70).

perception in consuming green technology presented polarized responses as the means were attainment lower and the standard deviations were getting higher (see Table 2). The high standard deviations for utmost of the questions shows inconsistency of the responses.

The attitude of TVET professional is very important towards use and adaptation of

Table 1: Green technology perception

S.N.	Questions	Mean(M)	Std. Deviation (SD)
1	Importance of green technology	4.42	0.68
2	Trees plantation to reduce greenhouse effect	4.53	0.66
3	Green technology is beneficial for personal health	4.60	0.66
4	Economic growth will improve by adopting green technology	4.33	0.70
5	Awareness session to enhance knowledge of green technology	4.43	0.61
	Total Average:	4.46	0.66

Hypothetically, the respondents agreed that they have very high perception of green technology. Though, in practice, their

green technology in their lives. TVET professional attitudes on green technology and practices of waste recycling is illustrated in Table 3 and 4.

Table 2: Green Technology Usage

S.No	Questions	Mean(M)	Standard Deviation (SD)
6	I use green technology to create healthy environment	3.22	0.69
7	I use organic material to reduce usage of chemical in my daily life	3.05	1.10
8	I stop buying spray that contains CFC because CFC is harmful to the ozone layer.	3.10	0.99
9	I bought stuff that can be recycled or made from recycled materials.	3.53	0.86
10	I practice recycling in my home and workplace	3.97	1.05
Total Average:		3.37	0.93

Table 3: Environment

S.No	Questions	Mean(M)	Standard Deviation (SD)
11	I understand the green technology helps us to decrease global warming.	4.35	0.79
12	I develop a plan of green technology to be used in my future workplace	3.99	0.71
13	I plant seeds and trees in my workplace to protect the environment	4.30	0.74
14	I attend environmental movement to use green technology	3.53	0.72
Total Average:		4.04	0.74

As mentioned earlier, environment and recycle waste categories depict high average that reflect the positive attitudes of the TVET professionals towards saving the environment and recycling the wastes. In table 3 prove that respondents agreed that green technology will decrease the global warming *(M=4.35; 0.79)* and they planned to develop a green technology plan in future workplace *(M 3.99; 0.71).* The idea of planted trees was strongly agreed by the respondents *(M 4.30; 0.74)* and lastly, attend the environmental movement *(M 3.53; 0.72).*

Table 4 on recycling waste, the respondents claim that they used recycled papers *(M=3.99; SD=0.98)* and throw toxic materials properly *(M=3.80; SD=0.78).* Further, TVET professional strongly agreed that they certainly not throw rubbish to the drains *(M=4.20; SD=0.62)* and used water carefully so that the water was not wasted *(M=4.40; SD=0.69).*

At the end, the open-ended questions about greening TVET and suggestion for additional ideas to enhance the perception of

Table 4: Recycling Waste

S.No	Questions	Mean(M)	Standard Deviation (SD)
23	TVET professional practice recycled papers	3.99	0.98
24	TVET professional appropriately throw away toxic chemicals	3.80	0.78
25	TVET professional do not throw garbage into drain	4.20	0.62
26	I use water minimally in order not to waste this precious resource	4.40	0.69
Total Average:		4.09	0.76

green technology among TVET professional in Pakistan. Surprisingly, 80% provided greening TVET examples in institutional context such as replace of tube light to saver and one-fourth (25%) said that they are using renewable energy sources such as solar panel, using hybrid car, hydroponic. Others provide popular instances of environmentally friendly policies such as reusing, planting trees, use paper bags (other than plastics) but these are not essentially characterized as green technology. The respondents suggested methods to promote greater perception of green technology at their future workplace. The most unique idea was to conduct green skills competition among TVET professional.

Conclusion and Recommendations

In a nutshell, the sample comprised of TVET professional from different TVET authorities in Pakistan, mostly aged between 31 to 40 years old. In this study, there is no noteworthy differences were identified concerning their perceptions on green technology through demographic variables. The results provoke that continued use of green technology substantial decreases the usage of chemical in my daily life, whereas the demand of renewable energies is increasing in Pakistan. Respondents strongly agreed that green technology was essential and it could improve their quality of life. In the literature, it has been identified that 'development' and 'environment' could be two opposite sides of a currency. If a TEVT authority focus on development, it may

cost the environment. If a country put high emphasis on development, it may 'sacrifice' the environment. Hence, United Nations document (2) advised that development and environment as two contraries, therefore it is more suitable to see them as complimentary and mutually supportive obligations. It is possible if the world decides to squeeze low-carbon, resource-efficient and to adopt green economic model.

Regarding, the practicing the green technology, the respondents provided polarized replies. Hence, it is important to nurture greening pillars for TVET professionals. Respondents consider that green technology will decrease global warming, if respondents decide to use green technology in their future workplace. Respondents planted trees but not very often join the environmental movements. Based on the findings of the research, we could conclude that green standards and thinking must be inculcate among TVET professional through Greening TVET concept. The five pillars of greening TVET must be put in workplace environment. The TEVTAs should also play pro-active role in adopting and implementing Greening TVET in their institutions.

Acknowledgement

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